Voice Annunciation Enhances SCADA System

The historic Iron House Sanitation District, Oakley, California, uses a RACO Verbatim Gateway Autodialer to add alarm reporting capability to their wastewater treatment plant SCADA system.

Rycon Systems, San Ramon, California, served as system integrator for the SCADA system, which monitors and controls the wastewater treatment plant and 30 lift stations.

At each of the lift stations, an Opto 22 controller is used to monitor high sump level, pump status, power consumption, and power failure. Each lift station controller is connected to a SCADA system central computer via radio modems.

Remote radio modems at each lift station and a master radio modem at the control center form a Radio Area Network (RAN)—or a wireless Local Area Network (LAN)—for SCADA system communications.

The entire system is directed by a PC-compatible computer running Paragon software. Offered by Intec Controls, Walpole, Massachusetts, the software program provides the high level supervisory control and information management functions required for system operation. The SCADA system central computer also communicates with another Opto 22 controller which interfaces the wastewater treatment plant control equipment.

The control computer continuously interrogates all of the remote sites and the plant control equipment. Performance and alarm data are received, logged, and reported at the control computer. The entire network can be scanned in three seconds.

In addition to the gathering of data from the remote sites, the software provides a graphical display of current process data, as well as hardcopy reports containing historical information. Using the graphical programming language, the control programs are defined and then downloaded to individual controllers for execution.

The Verbatim Gateway provides interactive monitoring and control of the controllers via the dial-up telephone network, allowing read and write access to controller data registers via any standard tone phone. It turns a conventional tone phone into an interactive, multi-functional operator interface. The system can monitor up to 96 points, reflecting any combination of discrete, analog, timer, counter, or other controller data object. The SCADA computer is programmed to collect and reformat data from the remote sites and discern alarm information. As alarms occur, site numbers and alarm information are relayed by Paragon to the Verbatim Gateway using a Modbus slave protocol.

Upon detection of an alarm condition, the system automatically starts calling a list of pre-programmed phone numbers, calling until it gets an answer. When a connection is made, the system reports the station identity and the specific alarm condition by way of the user's own voice-recorded message. Acknowledgement of the alarm is accomplished simply by pressing a button on the called phone. Calling is continued even if an alarm condition returns to normal—an intermittent or short duration alarm conditions does not go unnoticed. Once tripped, calling is continued until acknowledged by the called party.

In addition to alarm reporting, the system has a status-checking capability. The user can call in at any time from a conventional tone phone to hear a voice message giving the present status of all monitored functions. At any time, the user can also alter any monitored data table location or I/O points.